

## CLAIMS

1. A flow homogeniser for insertion in a pipeline conveying a particulate material carried by a carrier fluid comprising a pipe having an inlet end and 5 an outlet end and including a core defined by one or more core pipe sections connected in series between the inlet end and the outlet end, the or each core pipe section defining a relatively gradual or rapid change in cross-sectional area in order to mix particulate material and carrier fluid entering the inlet end to form a homogeneous mixture on exit from the outlet end.

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2. A flow homogeniser according to Claim 1 wherein the cross-sectional area of a core pipe section extending from the inlet end increases from the cross-sectional area of the inlet end to a relatively larger cross-sectional area.

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3. A homogeniser according to Claim 1 or Claim 2 wherein the cross-sectional areas of the inlet and outlet ends are equal.

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4. A flow homogeniser according to any preceding claim wherein the core is defined by two core pipe sections, the first core pipe section defining a relatively gradual increase in cross-sectional area from an inlet cross-sectional area to a maximum cross-sectional area and the second core pipe section defining a relatively rapid decrease in cross-sectional area from the maximum cross-sectional area to an outlet cross-sectional area.

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5. A flow homogeniser according to any one of Claims 1-3 wherein the core is defined by two core pipe sections, the first core pipe section defining a relatively gradual increase in cross-sectional area from an inlet cross-sectional area to a maximum cross-sectional area and the second core pipe

section defining a relatively gradual decrease in cross-sectional area from the maximum cross-sectional area to an outlet cross-sectional area.

6. A flow homogeniser according to Claim 4 or Claim 5 wherein the 5 length of the first core pipe section is 1.5 times the diameter of the core at the inlet end and the diameter of the core at the junction between the first and second core pipe sections is 1.3 times the diameter of the core at the inlet end.
- 10 7. A flow homogeniser according to any of Claims 1-3 wherein the core is defined by two core pipe sections, the first core pipe section defining a relatively rapid increase in cross-sectional area from an inlet cross-sectional area to a maximum cross-sectional area and the second core pipe section defining a relatively rapid decrease in cross-sectional area from the 15 maximum cross-sectional area to an outlet cross-sectional area.
- 20 8. A flow homogeniser according to any one of Claims 1-3 wherein the core is defined by two core pipe sections, the first core pipe section defining a relatively rapid increase in cross-sectional area from an inlet cross- sectional area to a maximum cross-sectional area and the second core pipe section defining a relatively gradual decrease in cross-sectional area from the maximum cross-sectional area to an outlet cross-sectional area.
- 25 9. A flow homogeniser according to any one or Claims 1-3 wherein the core is defined by four core pipe sections and a middle section, the first and second core pipe sections being connected in series between the inlet end and the middle section, and the third and fourth core pipe sections being connected in series between the middle section and the outlet end, the first core pipe section defining a gradual increase in cross-sectional area from an 30 inlet cross-sectional area to a first maximum cross-sectional area, the

second core pipe section defining a relatively rapid decrease in cross-sectional area from the first maximum cross-sectional area to a middle cross-sectional area, the third core pipe section defining a relatively gradual increase in cross-sectional area from the middle cross-sectional area to a 5 second maximum cross-sectional area and the fourth core pipe section defining a relatively rapid decrease in cross-sectional area from the second maximum cross-sectional area to an outlet cross-sectional area.

10. A flow homogeniser according to any one of the preceding claims  
10 further including a flow control system located at the inlet end.
11. A flow homogeniser according to any one of the preceding claims  
further including a flow control system located at the outlet end.
- 15 12. A flow homogeniser according to Claim 10 or Claim 11 wherein the  
flow control system includes at least one wedge-shaped ramp on an inner  
surface of the pipe.
13. A flow homogeniser according to Claim 12 wherein the flow control  
20 system includes a plurality of wedge-shaped ramps equidistantly spaced  
about the inner circumference of the inner surface of the pipe.
14. A flow homogeniser according to Claim 10 or Claim 11 wherein the  
flow control system includes at least one aerofoil on an inner surface of the  
25 pipe.
15. A flow homogeniser according to Claim 14 wherein the flow control  
system includes a plurality of aerofoils equidistantly spaced about the inner  
circumference of the inner surface of the pipe.

16. A flow homogeniser according to Claim 10 or Claim 11 wherein the inner surface of the input pipe section is shaped to define a flow control system in the form of a tapered throat.
- 5 17. A flow homogeniser according to Claim 10 or Claim 11 wherein the flow control system includes a combination of one or more wedge-shaped ramps, one or more aerofoils and/or a tapered throat.
- 10 18. A flow homogeniser according to any preceding claim further including one or more air jets at the inlet end.
19. A flow homogeniser according to any preceding claim further including one or more air jets at the outlet end.
- 15 20. A flow homogeniser according to Claim 18 or Claim 19 wherein the or each air jet is an active air jet where an external supply of compressed air is injected into the flow homogeniser.
21. A flow homogeniser according to Claim 18 or Claim 19 wherein the carrier fluid is air and the or each air jet is a passive air jet which sucks air from the pipeline at a location upstream of the flow homogeniser for injection into the flow homogeniser.